

Application No. 10/550,569
Amendment
Dated April 8, 2010

REMARKS

Claims 1, 4, 5, 7, 11-14, 19, 24, 25, 26, and 30-41 are pending. New claims 32-41 are added by this Amendment, and claims 16, 17, 18, and 23 are canceled. No new matter is added by the new claims or by the amendments to claims 1, 4, 5, 7, 11, 12, 19, 24, and 25, as there is full support for the amendments and the new claims in the specification and drawing. See "Support for Amendments" on pages 22-23 herein. Consideration and allowance of the amended claims and the new claims are requested for the reasons discussed below.

Interview Summary

Applicant's representative attended an interview with the Examiner and the Examiner's Supervisor on December 3, 2009 to discuss the Amendment After Entry of RCE which had been filed on October 27, 2009. On December 31, 2009 the Examiner entered an Office Action, which was transmitted to Applicant's representative on January 8, 2010 in which the Examiner rejected all of the then pending claims under §§ 102 and 103. The Office Action did not make any mention of the interview conducted on December 3, 2009 or any of the points discussed during that interview. Approximately two weeks after the Examiner entered the Office Action, the Examiner entered an Interview Summary on January 19, 2010. Although the Examiner's Interview Summary correctly stated that agreement with respect to the claims was not reached during the interview and fairly summarized some of the discussion during the interview, Applicant's representative respectfully disagrees with the Examiner's characterizations of the prior art and Applicant's apparatus on the Continuation Sheet of the Interview Summary.

The §102 Rejection

The Examiner rejected claims 1, 7, 11, 13-14, 19, 23-24, and 30 under §102 as being anticipated by Grenier (U.S. Pat. No. 5,412,954). The Examiner's reasons in support of this rejection are set forth on pages 2-4 of the Office Action.

The apparatus disclosed in Grenier is significantly different than Applicant's apparatus as claimed in amended independent claim 1. For the reasons previously discussed on pages 8-9 of the Amendment filed on May 19, 2009 and on pages 8-11 of the Amendment filed on October 27, 2009 (which reasons are incorporated herein by reference) and for the additional reasons discussed herein, independent claim 1, as amended, is not anticipated by Grenier and should be allowed.

Grenier does not teach all of the elements and limitations of Applicant's claimed apparatus of amended independent claim 1 arranged as in that claim. For example, Grenier does not teach a first self-contained distillation column module containing a high pressure cryogenic distillation column immediately adjacent and attached directly to a second self-contained distillation column module containing a low pressure distillation column.¹ Nor does Grenier teach positioning of a self-contained heat exchange module and a self-contained further processing unit immediately adjacent and attached directly to the first and second self-contained distillation column modules, as in Applicant's claimed apparatus of amended independent claim 1.

¹ Figure 3 of Grenier discloses a low pressure column 1A and a mean pressure column 1B both in sheath 15, with an additional column 1C (for argon production) connected to the low pressure column 1A and disposed in either sheath 15 or sheath 15A.

The fully assembled unit of Applicant's apparatus comprising the immediately adjacent modules attached directly to each other as arranged in independent claim 1 is illustrated in Figure 1 of Applicant's application. Comparing Applicant's Figure 1 to Figure 3 of Grenier, which figure the Examiner relies on in support of the § 102 rejection, shows clearly some of the differences between Grenier's apparatus and Applicant's claimed apparatus.

In addition to the fact that the low pressure column 1A and the mean pressure column 1B of Grenier are not contained in separate self-contained modules, there is substantial space between the sheath 15 and the service module 19B. There are even wider spaces between sheath 15 and auxiliary box 19A, and between sheath 15 and cold box 19. In addition to the fact that sheath 15 is not immediately adjacent cold box 19 (or auxiliary box 19A, or service module 19B), sheath 15 is not attached directly to cold box 19. Rather, cold box connection 20 (which contains duct sections 21) connects cold box 19 to the inlets/outlets 17 of sheath 15.

In addition, the apparatus disclosed in Grenier is limited to column diameters corresponding to productions of oxygen which may reach only up to about 1,000 tons/day. Col. 3, ll. 46-53. In contrast, Applicant's claimed apparatus of amended independent claim 1 is a pre-assembled fully assembled unit adapted to be erected as the fully assembled unit at a site for a cryogenic air separation plant designed to produce at least 2,000 metric tons/day of a gas product. Application at page 5, lines 1-3.

By positioning the self-contained modules of Applicant's claimed apparatus immediately adjacent each other and using direct attachment (as in amended claim 1, and using cross-over structures as in new claims 33, 34, 40, and 41), the structural integrity of the fully assembled unit is increased significantly, thereby reducing the risk that the apparatus will be damaged (e.g., by buckling) when the fully assembled unit is transported a substantial distance and erected at

the distant site. This significantly increased structural integrity of the fully assembled unit due to the arrangement of the modules is not taught or disclosed by Grenier.

Persons skilled in the art would not even consider transporting the apparatus shown in Figure 3 of Grenier as a single unit in view of the significant space between sheath 15 and cold box 19. The lack of structural integrity of such an apparatus would mean a significant risk of potential damage during any attempted transportation of the apparatus from a first location to a second location at a substantial distance from the first location. In addition, the apparatus of Grenier includes various components which are not even integrated in a module and are separated from cold box 19 and sheath 15, such as air compressor 3, water cooler 6, and water/CO₂ removal device 4, as shown in Figure 3 of Grenier. This scattered arrangement of major elements of the apparatus further supports the position that the apparatus of Grenier cannot be transported and erected safely (*i.e.*, without damage to the apparatus) as a single pre-assembled fully assembled unit like Applicant's apparatus of amended independent claim 1.

In fact, as previously discussed, Grenier does not teach transporting his apparatus as a single pre-assembled fully assembled unit from one location to a distant site for a cryogenic air separation plant. To the contrary, Grenier teaches away from transporting his apparatus as a single pre-assembled fully assembled unit to a distant site for cryogenic air separation or erecting the apparatus as a single pre-assembled unit at such a site. See the discussion in support of this position in the Amendment filed on October 27, 2009 at pages 8-10.

Therefore, in addition to the fact that Grenier does not disclose all of the self-contained modules immediately adjacent to and attached directly to each other as in Applicant's claimed apparatus (*i.e.* arranged as in amended claim 1), Grenier also does not teach or disclose the following limitations of amended independent claim 1:

wherein said fully assembled unit is adapted to be transported as a single pre-assembled fully assembled unit from a first location to a second location at a substantial distance from the first location, and wherein the transported single pre-assembled fully assembled unit is adapted to be erected as the fully assembled unit at a site for a cryogenic air separation plant designed to produce at least 2000 metric tons/day of a gas product.

The entire apparatus of Grenier is not adapted to (or designed to) be transported as a single pre-assembled unit from a first location to a second location at a substantial distance from the first location, nor is it adapted to (or designed to) be erected as a single pre-assembled unit at a site for a cryogenic air separation plant designed to produce at least 2000 metric tons/day of a gas product. Accordingly, there are structural differences between the apparatus of Grenier and Applicant's apparatus as claimed in amended independent claim 1. *See, In re Venezia*, 530 F.2d 956, 959, 189 USPQ 149, 152 (CCPA 1976) (limitation "adapted to be positioned" served to precisely define present structural attributes of interrelated component parts of claimed assembly), cited in MPEP 2173.05(g).

It is the arrangement of the elements of Applicant's apparatus (*i.e.*, arranged as in amended claim 1) which provides the structural differences. In other words, Applicant's claimed apparatus is adapted to be transported as a single pre-assembled unit and is adapted to be erected as a single pre-assembled unit because of the way that the self-contained modules are positioned (*i.e.*, immediately adjacent to each other) and are attached directly to each other (as in amended claim 1). Therefore, there are multiple structural differences between Applicant's claimed apparatus and the apparatus disclosed in Grenier, which therefore is not an anticipating reference.

In order to anticipate under § 102, a reference must not only disclose within the four corners of the document all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370-71, 88 USPQ2d 1751, 1759 (Fed. Cir. 2008). Since Grenier does not teach or disclose each and every limitation and element of Applicant's claimed apparatus arranged as in amended independent claim 1, the subject matter of said claim is novel and claim 1, as amended, should be allowed. New independent apparatus claim 32 and new independent method claim 35 also are novel and should be allowed.

The amended dependent claims (e.g., claims 7, 11, 13, 14, 19, 24, and 30) which depend from amended independent claim 1 also are not anticipated by Grenier because said dependent claims also include the limitations and elements of amended independent claim 1 (arranged as in claim 1) which are not taught or disclosed by Grenier. Accordingly, dependent claims 7, 11, 13, 14, 19, 24, and 30, as amended, also are novel and should be allowed.

The §103 Rejections

The Examiner rejected claims 1, 7, 11, 13-14, 16-19, 23-24, 25-26 and 30 under §103 as being unpatentable over Grenier in view of Bracque et al. (U.S. Pat. No. 5,461,871) [hereinafter Bracque (871)]. Claim 1 is the only independent claim of the claims rejected as obvious based on the combination of Grenier and Bracque (871).

In discussing the rejection of independent claim 1 as obvious under § 103, the Examiner conceded on page 7 of the Office Action that:

Grenier teaches all of the limitations of the apparatus as described above but does not explicitly teach performing the method of constructing the apparatus to produce the fully assembled unit, transporting the single pre-assembled unit to the site for the

cryogenic air separation plant, and erecting the single pre-assembled unit on site. (Emphasis added).

The Examiner contends, however, that based on “common knowledge” it would have been obvious “to construct the unit and then transport the unit to a site for erection and operation for the purpose of having fewer modification steps to bring the apparatus into operation for the purpose of controlling the manufacturing process more carefully and for the purpose of keeping the manufacturing process secret.”

The Examiner also contends that the combination of the teachings of Grenier and Bracque (871) shows that such an apparatus would be obvious to one of ordinary skill in the art at the time the invention was made. For the reasons discussed below, Applicant’s apparatus of amended independent claim 1 is not obvious.

As discussed above with respect to the § 102 rejection, Grenier does not teach or disclose all of the elements and limitations of amended independent apparatus claim 1 arranged as in the claim. Bracque (871) does not cure the deficiencies of Grenier, since Bracque (871) also does not teach or disclose the elements and limitations of independent claim 1, as amended, which are not disclosed by Grenier.²

Furthermore, Applicant notes that the language in Bracque (871) at column 1, lines 11-18 suggests that this reference also “teaches away” from Applicant’s claimed apparatus of amended independent claim 1. Specifically, the first sentence of that passage states: “It has been proposed to preassemble in the factory all of the installation, except the air compressor

² To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974).

group and the cylinders for the purification of air by adsorption.” (Emphasis added). This statement makes clear that the apparatus disclosed by Bracque (871) does not teach or disclose a fully assembled unit adapted to be transported as a single pre-assembled fully assembled unit, which is adapted to be erected at a site for a cryogenic air separation plant. Accordingly, a person skilled in the art would not combine Bracque (871) with Grenier, which also teaches away from Applicant’s claimed apparatus, as previously discussed on pages 8-9 of the Amendment filed on May 19, 2009 and on pages 8-11 of the Amendment filed on October 27, 2009 (which reasons are incorporated herein by reference).

Therefore, since a person skilled in the art would not combine Bracque (871) with Grenier, Applicant’s claimed apparatus of amended independent claim 1 is not obvious over the combination of those two references. Furthermore, as indicated above, Bracque (871) does not cure the deficiencies of Grenier, and the combination of the two references therefore does not teach all of the elements and limitations of amended independent claim 1 arranged as in that claim.

Also, the Examiner’s assertions based on the “common knowledge” constitutes impermissible hindsight. It is impermissible to review Applicant’s disclosure of his claimed apparatus and method, including all of the advantages and benefits of said inventions, and then with hindsight state that it would have been obvious to construct and transport a single pre-assembled fully assembled unit to a distant site for erection and operation.

The problems addressed and solved by Applicant provide support for the conclusion that Applicant’s apparatus of amended claim 1 is not obvious. Those problems, expressed in the form of “needs,” are discussed in Applicant’s application at page 3, line 1 to page 4, line 2.

In addition, the benefits and advantages of Applicant's claimed apparatus and method provide further support for the conclusion that the claimed apparatus and method are not obvious. See, for example, the benefits discussed in Applicant's application at page 4, line 29 to page 5, line 3. See also the advantages discussed in the application at page 9, line 28 to page 10, line 2.

For all of the above reasons, Applicant's apparatus of amended independent claim 1 is not obvious, and claim 1, as amended, should be allowed.

Since independent apparatus claim 1, as amended, is non-obvious under § 103, all of the dependent claims (including amended dependent claims 4, 5, 7, 11-14, 19, 24, 25, 26, 30, and 31) which depend from independent apparatus claim 1, as amended, also are non-obvious. *In re Fine*, 837 F.2d 1071, 1076, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). Accordingly, dependent claims 7, 11, 13, 14, 19, 24, 25, 26, and 30, all of which were rejected under § 103 as being unpatentable over Grenier in view of Bracque (871), are non-obvious and should be allowed, as amended, together with amended independent claim 1.

The Examiner also rejected dependent claims 4-5 and 31 under § 103 as being unpatentable over Grenier in view of Bracque et al. (U.S. Pat. No. 5,349,827) [hereinafter Bracque (827)]. For the reasons discussed below, Applicant's apparatus claimed in dependent apparatus claims 4-5 and 31, as amended, is not obvious in view of the cited references.

In support of the rejection of dependent apparatus claims 4 and 5, the Examiner stated: "Grenier teaches all of the claim limitations of claims 4-5, but does not explicitly teach that the diameter of the column (1B) is over 3.5 meters or about 5 or 6 meters (16-19 feet)." (Emphasis added). The Examiner then explained how, according to his position, said missing teaching (column diameter size) would have been obvious to one of ordinary skill in the art at the time

Applicant's invention was made in view of distillation columns having diameters of about 5 meters as taught by Bracque (827).

However, Grenier does not teach all of the other claim limitations of amended dependent apparatus claims 4 and 5. As discussed above, with respect to the §102 rejection, Grenier does not teach or disclose several limitations of amended independent apparatus claim 1 arranged as in the claim. Bracque (827) does not cure the deficiencies of Grenier, since Bracque (827) also does not teach or disclose all of the limitations of amended independent claim 1, arranged as in the claim, which are not disclosed by Grenier. Accordingly, dependent apparatus claims 4 and 5, as amended, (which claims depend from amended independent claim 1) are not obvious in view of the combination of Grenier with Bracque (827).

Dependent claim 31 also is not obvious in view of the combination of Grenier with Bracque (827) for the same reasons discussed above with respect to dependent claims 4 and 5. Since independent apparatus claim 1, as amended, is non-obvious under §103, all of the dependent claims (including dependent claims 4, 5, 12, and 31) which depend from independent apparatus claim 1, as amended, also are non-obvious. *In re Fine, supra.*

The Examiner also rejected dependent apparatus claim 12, which depends from independent claim 1 (as dependent claim 11, from which claim 12 depends, depends from claim 1), as being unpatentable over Grenier in view of Zarate (U.S. Pat. No. 4,957,523). For the reasons discussed below, Applicant's apparatus claimed in dependent apparatus claim 12 is not obvious in view of the cited references.

In support of the rejection of dependent apparatus claim 12, the Examiner stated: "Grenier teaches all of the limitations of claim 12 but does not explicitly teach that the air purification unit (4) comprises at least two air purification vessels arranged in parallel, each

vessel comprising at least one bed of carbon dioxide and/or water adsorbent material.” (Emphasis added). The Examiner then explained how, according to his position, said missing teaching (purification system) would have been obvious to one of ordinary skill in the art at the time Applicant’s invention was made in view of the air purification system taught by Zarate.

However, Grenier does not teach all of the other claim limitations of dependent apparatus claim 12. As discussed above, with respect to the §102 rejection, Grenier does not teach or disclose several of the limitations of amended independent apparatus claim 1 arranged as in the claim. Zarate does not cure the deficiencies of Grenier, since Zarate also does not teach or disclose all of the limitations of amended independent claim 1, arranged as in the claim, which are not disclosed by Grenier. Accordingly, dependent apparatus claim 12 (which depends from independent claim 1) is not obvious in view of the combination of Grenier with Zarate.

Support for Amendments

Support for the amendments in the pending claims and for new claims 32-41 may be found at various places in Applicant’s disclosure, primarily Figure 1 and the specification at page 10, line 30 to page 12, line 14. For some of the specific terms listed below, support may be found at least where noted below.

self-contained	Abstract; Figure 1; and page 6, lines 10-11
high pressure, and low pressure	Figure 1; page 5, lines 15-20; and page 11, lines 1-10
immediately adjacent	Figure 1; page 9, lines 4-10; page 10, line 30 to page 12, line 14
fully assembled	Figure 1; page 4, lines 29-34; page 7, lines 25-35; page 9, lines 4-30; and page 10, line 34 to page 12, line 14
2000 metric tons/day	page 4, line 35 to page 5, line 3

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Amended claims 7 and 24 are supported by original claim 8, Figure 1, and the specification at page 11, lines 27-30. That support also applies to new claims 33 and 40.

New apparatus claims 32-34 are fully supported by the specification and Figure 1. The term "cross-over structure" in apparatus claims 7, 33, and 34 (and in method claims 24, 40, and 41) is supported by Figure 1 and by the specification at page 11, lines 12-15 and 27-30.

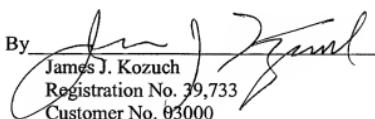
New method claims 35-41 are supported by the specification at page 8, line 4 to page 9, line 26. Additional support is found in original method claims 19-26. With respect to the terms "dockside" and "transported by sea," see page 9, lines 21-25.

CONCLUSION

Applicant believes that the foregoing constitutes a complete and full response to the non-final Office Action dated January 8, 2010. In view of the amendments and the remarks above, the present application is in condition for allowance and a Notice to that effect is respectfully solicited.

Should the Examiner deem that any action on the part of Applicant would advance prosecution, the Examiner is invited to telephone Applicant's attorney.

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By 
James J. Kozuch
Registration No. 39,733
Customer No. 03000
(215) 567-2010
Attorney for Applicant

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